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Tunica Vaginalis Testis,

WITH A CASE.

BY WILLIAM M. MASTIN, M. D. (UNIV. PENNA),

OF MOBILE, ALABAMA.

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THE rare pathological condition of effusion of chylous fluid into the cavity of the tunica vaginalis testis has been described under the several designations of *galactocele*, *chylous hydrocele*, and *chylocele*, by certain writers and the few observers who have recorded such instances.

The appellation of galactocele was applied to the affection by Vidal [1] (de Cassis) and Ferguson,[2] who, ignorant as to its true pathogeny, so termed it, evidently, on account of the physical characters of the fluid; Dr. Busey [3] offers for the lesion the title of chylous hydrocele, but which, though warranted, perhaps, by the usual application of the term hydrocele, the actual derivation of the word (ὕδωρ, 'water,' and κήλη, 'a tumor') scarcely justifies; and by Dr. Claudius H. Mastin,[4] it is denominated chylocele;—the latter of which we now propose to employ as most descriptive of the malady, and thus conveying an accurate and intelligent idea of the nature of the morbid process.

[1] Aug. Vidal (de Cassis), Traite de Pathologie et de Médecine Opératoire, 5th Ed., vol. v, p. 180, 1861: Samuel C. Busey, Narrowing, Occlusion, and Dilatation of Lymph Channels, Acquired Forms, p. 80, reprint from No. 3, 1876, to No. 8, 1878, inclusive, New Orleans *Med. and Surg. Journal.*

[2] Trans. Path. Soc. Lond., vol. xvi, p. 184, 1865; quoted by Busey, op. citat. p. 82.

[3] Op. citat: Holmes' Surgery, by Packard, Art. Injuries and Diseases of the Absorbent System, vol. ii., p. 465, Phila., 1881.

[4] *Amer. Med. Weekly*, Louisville, Ky., vol. ii, No. 25, p. 617, June 19th, 1875; also Busey, op. citat., p. 83.

Although recognizing the comparative deficiency in our knowledge of injuries and diseases of the lymph system, the paucity of the literature of this interesting affection is somewhat surprising; for, notwithstanding that surgical authors make frequent reference to the occasional milky appearance of the fluid of hydrocele, and which is ascribed by some either to the presence of spermatozoa, or a fatty degeneration of the epithelial cells lining the serous membrane of the sac, there are but few examples in medical annals where this trouble is recognized and described as being distinct from ordinary or common dropsy of the testicular vaginal tunic.

On account, therefore, of this meagreness, and before detailing the history of the case which we desire to add to the scanty list, and which forms the subject of this paper, it will be interesting to present a summary of those cases comprising the published statistics of the disorder.

(1.) The patient of Vidal [1] ("*Galactocele*") was a man of large physique, robust, and of bilio-sanguine temperament. Previous health good. A dyer up to his fifteenth year, and then a soldier in Africa. Had suffered several times from gonorrhœa, but testicles and scrotum had never been the seat of any previous disease. The penis was normal. About eight months before, whilst resting quietly, he experienced a decided heaviness in the scrotum, and then, for the first time, noticed an enlargement, which finally became so bulky as to impede locomotion. The two tumors were similar in form to hydrocele, the lower and larger extremities equalling a child's fist. There was no fluctuation or transparency, but methodical pressure easily defined the position of the testicles. Spermatic cords healthy. His breasts resembled those of men generally. He drank little milk but wine freely, though not to excess, and his diet was animal. Sexual

[1] Op. citat: Holmes' Surgery, loc. citat: Busey, op. citat.

abilities perfect and marked. Puncture and evacuation of a milky fluid showed the testes to be smaller than natural, although the penis was of a size corresponding to the age of patient. Prostate gland and vesiculæ seminales normal. Analysis of the fluid, by M. Grassi, gave, water; a substance differing from albumen, but analogous to it, and perhaps identical with casein; a fatty body having the physical characters of butter; sugar; sodium chloride; traces of calcium—probably the chloride; alkaline, and spontaneously coagulable. A high power of the microscope discovered a multitude of very small transparent globules, some spherical, others irregular, but all presenting the appearance of globules of butter. Boiling did not cause coagulation, as is usual with hydrocele fluid.

(2.) Ruthnum's[1] case ("*Hydrocele, with contents simulating chylous urine.*") C., aet. 25 years; potmaker; hydrocele of right tunica vaginalis of size of large orange, which was stated to have reappeared after an operation and injection of equal parts of tinct. iodine and water twenty days previously. Contents measured 13 fl. oz. in amount, was thick, and the color of milk, with greenish tinge. Coagulated spontaneously. Neither pus nor mucus found.

(3.) The case of Ferguson[2] ("*Galactocele*"). A German, aet. 42 years; healthy in appearance. Tapped three times within last twelve months, and on each occasion a fluid with all the physical characters of milk was drawn off. The case resembled ordinary hydrocele in both history and external characters, and fluctuation so palpable that transparency test not employed. The fluid had sp. gr. 1,019; alkaline; was indistinguishable from milk to the eye, and emitted sulphuretted hydrogen—from partial decomposition. Milky

[1] T. Ruthnum, *Madras Quar. Jour. Med. Sci.*, p. 421, 1862–4; quoted by Busey, Op. Citat., p. 81: and in Holmes' Surg. loc. citat.

[2] Loc. citat: also Holmes' Surg. loc. citat.

appearance due to the presence of fat—which ether dissolved, leaving a transparent, hydrocele like fluid. Heat and acid nitric produced a copious deposit of albumen, and the supernatant liquid contained sugar and a protein substance similar to casein. Inorganic ingredients were lime, soda and potash, combined with phosphoric, sulphuric, and hydrochloric acids. The microscopic examination of a recent specimen (by Dr. George Harley and Mr. Francis Mason), showed a colorless fluid with many small globules, like milk globules, only smaller, floating in it. Also a number of minute granules, and a few large cells filled with oily particles, not unlike colostrum corpuscles. Upon the surface of a portion of the fluid, after the lapse of a month, a curd formed. somewhat similar to cream, but paler and deficient in fatty matter. The scanty deposit was composed of some quite large oil globules, and scattered stellate crystals of margaric acid.

(4.) The fourth is the patient of Dr. Claudius H. Mastin[1] ("*Chylocele.*") W. H. W.; 22 years old; five feet and eleven inches in height; weight, 157 pounds; robust health; bilious temperament; brunette; presented for treatment October 18, 1874. Eight years previously he noticed an enlargement of the scrotum, which gradually increased for four years, when, consulting a physician, he was tapped, and a quantity of "white fluid" drawn off; but the sac refilling successively, the same operation was repeated three times thereafter. The case presented every appearance of hydrocele, and he was now tapped again, and eight ounces of a thick, milk-like fluid evacuated. The sac was dense, firm, and elastic. Testicle slightly enlarged, but no evidence of disease of the gland. An analysis, by Dr. James Tyson, showed the fluid to be alkaline; sp. gr. 1,015; highly albuminous; and composed, microscopically determined, of innumerable mole-

[1] Loc. citat: also Holmes' Surg. loc. cit.

cules, which were mere points under a power of 400 diameters, with a limited number of small granular cells, somewhat smaller but otherwise resembling the colorless blood corpuscles, floating in a serous fluid. Physical characters exactly those of chyle; completely dissolved by ether, which after evaporation left a cream-like mass.

Dr. T. continues: "The fluid is not only in its physical but in its chemical characters comparable to chyle, and I believe its origin to be similar to that of chylous urine, so called, which is probably due to the leakage of a lymph vessel in the bladder." After the last tapping patient was not seen until April, 1875, when the sac was then opened by an incision of three inches in length, and eight ounces more of the same kind of fluid discharged. Sac dense, hard, and thick. The cavity smooth, polished, and pearly white, and at upper part, at junction of cord with testicle, a small, round, granular-looking mass, about size of an English pea, was seen. This was snipped off, and at its base was recognized the patulous orifices of three or four small vessels which did not bleed. These vessels were dissected back, were found to pass into the cellular tissue around testicle, and were then tied *en masse* with a silk ligature, and ends brought outside. The front wall of vaginal tunic was excised, its edges coaptated over a drainage tube by silk sutures, and the pin suture employed in the closure of the cutaneous wound. Recovery rapid, and was permanent more than six months[1] after operation.

The above concludes the bibliography of those recorded instances of which we have any knowledge, and to this number we now add another—a case of our own—as follows: Robert G. Allison; age 22 years; white; American; a decided blond; somewhat below medium stature; car-

[1] *Note.*—In 1880, this patient was again seen and examined, and still no evidences of return of accumulation.

driver, and a resident of Mobile; presented himself, June 2d, 1881, for relief of a chronic urethral discharge and a troublesome affection of the testes, and gave this history: General health excellent; no hereditary disease, family history being good; has never had syphilis, nor has he suffered from any especial disorder until his present malady, although some years ago he did have an enlargement with suppuration of one of the cervical glands, from which a depressed cicatrix is now plainly visible in the right submaxillary region. About four years ago he noticed that both testicles were enlarged, firmer than natural, and the seat of occasional erratic and dull pains. There was no apparent cause for this enlargement. They slowly, but gradually, increased in volume until about nine months since, when he contracted a gonorrhœa, and, although this was not complicated by an orchitis, yet the attack seemed to influence the original trouble, for his testicles grew larger and rapidly assumed their present dimensions. This blennorrhagia lasted a long time, and finally dwindled down into a gleet, which still exists. Careful examination now reveals a gleety discharge from urethra, accompanied by a contracted meatus, and a decided increase in the size of both testicles. The right tumor is in bulk equal to a man's fist, pyriform in shape, opaque as tested by transmitted light, somewhat elastic, with slight fluctuation, and at its posterior and upper parts, in the region of the cord, filled with irregular, tortuous, worm-like masses, resembling the venous enlargement and thickening of varicocele. Testicle indistinctly defined. Left tumor much smaller with no perceptible fluctuation, not transparent, but there are found also similar corded and tortuous masses. These irregular and knotted bodies are somewhat diminished by the recumbent posture, especially those of the left side, but the actual proportions of tumors are but little changed thereby. Pain of a dull, aching char-

acter sometimes occurs at intervals, extending in the course of the cords, but otherwise these tumors produce no other annoyance than a feeling of heaviness, occasioned by their weight. Pressure gives no pain. The glands of the entire right inguinal (the chain extending down to saphena opening on thigh), a few in left inguinal, and scattered glands in both axillary and cervical regions are enlarged. Diagnosis is, hydrocele complicated with varicocele in right testicle, and varicocele in left.

July 22d. The left tumor is in *statu quo*. Right tumor perceptibly larger than when last seen, and palpation discovers very distinct fluctuation. Aspirated and emptied the tunica of 3 fl. oz. of a milky fluid. Examination of the testicle now shows that gland to be of normal size, but occupying its upper and posterior part, where joined by the cord, and along the course of the cord, are the same masses above referred to. These have all the characteristics of varicose veins, except two or three of the masses which are firmer, non-compressible and more prominent. The left tumor not disturbed. Cold hip baths and a closely-fitting suspensorium directed to render the patient more comfortable, and, the case being now considered one of chylocele, or the leakage of a lymph duct into the cavity of the vaginal tunic, the radical operation of cutting down upon and ligating the vessel was advised. Urethral discharge to be treated by large steel sounds and injections.

July 25th. Fluid has measurably re-accumulated in sac. Will submit to an operation when weather becomes cooler.

A chemical and microscopical analysis of the fluid, very kindly made by Professor Tyson, of Philadelphia, is here shown:

"An opaque white, milk-like fluid, apparently also, as consistent as milk, with a slightly saline or fishy odor; sp. gr. 1,018, and faintly alkaline in re-action. *Microscopically* ex-

amined, in a molecular base, of which the particles were so minute as to appear as mere points under a power of 400 diameters, floated other irregular particles ranging in size from the molecules alluded to, to .0250 and .05 millimetre. These particles are exceedingly irregular, some being linear, others stellate with intermediate forms, suggesting a crystalline appearance. There were also a few leucocytes and as many compound granule cells. The former were small in size, measuring generally .05 millimetre. The compound granule cells ranged in size from .1 to .2 millimetre. There were a few spermatozoids, but no oil globules. But all of these elements, except the leucocytes and spermatozoids, were easily soluble in ether, when shaken up well in a test tube, leaving amorphous masses of fat, after evaporation of the ether. Whether the irregular crystalline (?) particles were crystals of some of the fatty acids or simple fat particles, I am unable to say, but they dissolved readily in ether. The elements of the fluid are plainly those of chyle, and I have no doubt that it is really chyle which, in some inexplicable way, finds its way out of the usual channels into the tunica vaginalis, our modern knowledge of the lymphatic system rendering this less strange than formerly." * * * "The compound granule cells are probably fattily degenerated cells from the lining of the tunica."

After placing patient on appropriate preparatory treatment, operated to-day (October 19th) in the presence of Drs. Ketchum, Toxey, and Claudius H. Mastin, as follows: Plunging a small trocar and canula into the tumor (right) at its lower and anterior portion, as in tapping for hydrocele, and evacuating 1½ fl. oz. of the same chylous fluid, the instrument was carried upwards for about 2½ inches and made to re-puncture the sac from within outwards; the trocar was now removed, leaving the canula transfixing the sac, and a grooved director passed through the canula from

its distal end, the latter of which was then itself withdrawn, and the director left in its place passing from puncture to counter-puncture. The entire thickness of this intervening bridge of tissue being rapidly divided by a single stroke of the bistoury, the cavity of the sac was thus opened to the above mentioned extent. The tunica was found to be apparently normal, quite thin, and shining. Testicle itself healthy, but, on its upper and front surface, in the position of its juncture with the cord, was seen a smooth and rounded lump, similar in bulk and contour to the head of the epididymis. Projecting from this was an irregular prominence or nodule, resembling the large button-like granulation often observed at the orifice of a long-standing fistula, and about the size of a small grain of corn. This nodule was moist and oozing, although no opening upon it was discernible; but, being considered the source of the leakage, it was transfixed through the middle of its base by a needle armed with a double carbolized cat-gut ligature, each ligature tied separately and their ends cut short, and the nodule abscised. On the cut surface of the stump was at once recognized the patulous mouth of a vessel, near the size of a knitting-needle, from which oozed a milky fluid. The lumen of the divided vessel was seen also in the nodule removed. The tunica was then closed by a continuous carbolized animal suture, the skin wound coaptated by pin sutures, and the testicle elevated and bathed with a lotion of lead water and opium.

October 20th. Moderate increase in temperature, and he suffers some pain. Wound looks well. Ordered fifteen grains of quinine to be given within next eight hours.

October 21st. Temperature 101½. Testicle enlarged to size before operation, painful, and sensitive to pressure. Quinine in full doses. October 22d. Temperature 100. Tumor somewhat larger, but hard, and not so tender to

the touch. Pins removed. Quinine continued. October 23d. Getting on nicely. Testicle diminishing in size, less sensitive, and but little pain present. Temperature 99½. October 24th. Still improving. Temperature 99. Pain and swelling diminishing. October 26th. Chill followed by considerable febrile rise last A. M., but to-day temperature down to 98⅘, and other symptoms favorable. Quinine increased. A few drops of healthy pus ooze from cutaneous wound, but incision through tunica seems to be entirely healed with apparent occlusion of its cavity. October 29th. Discharged cured. Sac evidently occluded. No pain of any description, and testicle almost of normal size.

March, 1882. Re-examined patient, and found cure permanent. Testicle natural, and no evidence of refilling.

The little nodular growth removed was placed in absolute alcohol, and sent also to Dr. Tyson, to whom we are indebted for the subjoined microscopic examination of its elements.

Of this, Dr. T. says: "The nodule exhibits a cavernous structure, of which some of the spaces are evidently filled with blood. Others I believe to be lymphatic vessels. To this conclusion I come, not because of any difference in the walls of the two sets of vessels, but because the cells in the supposed lymph vessels exhibit the appearance of, and behave upon staining, like lymph cells. They take the staining readily, while the red corpuscles in the veins do not stain at all, but retain the yellow color usual to them under these circumstances. Further, the lymph vessels contain only the lymph cells referred to, and no red blood corpuscles. One would expect that a transverse section successfully made would show the lumen of a large vessel corresponding to 'the patulous mouth of a vessel—the size of a large knitting needle—from which oozed the same milky, glutinous fluid which characterized the specimens aspirated.' (These

last words I quote from your letter). But of course in the shrunken state of the nodule after its maceration in alcohol it was impossible to detect this, and we had to take our chances of cutting it transversely. We apparently failed to make a transverse cut of the large vessel, as no appearance of one is found in our sections, those to which I referred being small vessels. Some empty clefts and nearly circular spaces are present quite large enough to be seen by the naked eye, but it is impossible to say these are lymph vessels. It is barely possible that if a small hair had been introduced into the lumen of the vessel before it was sent, we might have succeeded better in cutting this large vessel. However, independently of these results, which are confirmatory, I think your observation is a conclusive one."

In this connection, it is well to suggest that, the length of time the nodule was macerating in alcohol did, indeed, produce so much hardening and contraction of its tissue as to reduce the dimensions of an otherwise large vessel, to one of a very moderate or even small diameter, and, if so, of course the mouth of a large vessel was not to be recognized by the microscope. When first removed, the ample lumen of a vessel was distinctly visible, and the reason of Dr. Tyson's failure to discover it may have been attributable to the above cause, or, it is possible, the opening itself was simply a portion of an ampulla—like dilation of a lymph duct, through which the sections did not happen to pass. As Dr. Tyson remarks, however, the undoubted existence of lymph spaces and small lymphatic vessels in the mass, with the other lymph elements found present, is confirmatory evidence, and renders the "observation a conclusive one." Thus, this patient, in conjunction with the one of Dr. C. H. Mastin, in whom a lymphatic varix on the surface of the vaginal tunic was for the first time actually demonstrated, are certainly adequate to decide the question of the path-

ology of this hitherto obscure affection; and, furthermore, as suggested by Dr. Tyson and others, affords a ready and rational explanation of the cause of chylous urine, namely, rupture of a lymph duct within or on the surface of the bladder wall, or, at least, somewhere in the urinary tract posterior to the urethra. Indeed, this is quite in accord with the lesions found attending the effusion and accumulation of chyle in the other serous cavities of the body, since the large majority of the recorded instances of such effusions into the peritoneal and pleural sacs have been shown conclusively to be associated with a rent in a neighboring lymphatic vessel—especially the receptaculum chyli and its continuation, the thoracic duct—communicating with these cavities, either from disease of the vessel wall, an interference or obstruction to the easy movement of the chyle stream, or some direct casualty. In the case of Winckel,[1] where there existed an abundant accumulation in the peritoneum, microscopic examination of the fluid revealed the presence of enormous numbers of "small filiform entozoa;" but, beyond the significance of the fact, these parasites were not proven to stand in any causative relationship to the disease, and besides, there were evidences of lymphatic engorgement and obstruction sufficient, probably, to have accounted for the effusion.

The rareness of the malady, at least, as would appear from the fewness of the related cases, together with the almost total deficiency in its literature, and of our knowledge of its attending pathological conditions, and, indeed, in all diseases of the lymphatic system, renders a careful consideration and analysis of these cases of chylocele peculiarly interesting and important.

In pursuance of such an examination, we will review

[1] F. Winckel, Deutsch Archiv fur Klin. Med. 1876, Bd. 17, p. 303. Busey op. citat.

the points of special interest as they present, and to this end we proceed to inquire into the *causes* of chylocele.

From the foregoing observations, referring to the lesions in chylothorax,[1] and chylous peritoneal dropsy, it would seem justifiable to make the assertion that, in this, as in the leakage of chyle into the pleura and peritoneum, the cause resides in a rupture of a lymphatic, and consequent out-pouring of fluid, into the tunica vaginalis testis.

As to the agency producing this rupture or bursting, however, the cause is not so apparent, since we are restricted, necessarily, to the insufficient histories of only these few detailed cases, and which do not offer any particular clue towards the elucidation of this point.

That climate is a markedly predisposing cause in certain lymphatic diseases is a thoroughly attested fact, and especially in chylous urine has it been demonstrated that residence in tropical latitudes is a prominent factor in this causative relation. Out of thirty cases of this malady (chyluria) collected by Roberts,[2] twenty-four of the number were either born or had resided in the Mauritius, Isle of Bourbon, Brazil, West Indies, or India, and it is declared upon excellent authority that, in these countries the affection prevails endemically. But, it must be added, there are some few authenticated cases which had never been out of Europe.

In the cases of chylocele, two of them furnish the history of such a predisposing influence, namely, (1) the case of Vidal, who campaigned in Africa, and (2) Ruthnum's case.

[1] *Note.*—We suggest this term in preference to that of "chylous hydrothorax"—the one now in use to describe the condition of chyle accumulation in the pleural sac—upon the same principle of preferring chylocele to chylous-hydrocele. In accordance with the etymology of the words, we speak of *pyothorax*, *pneumothorax*, and *hydrothorax*, as properly and accurately designating the effusions of *pus*, *air*, and *water*, into the cavity of the thorax, and certainly the collection of chyle in this cavity is most, indeed only, correctly distinguished or expressed by the word *chylothorax*.

[2] Urinary and Renal Diseases, 3rd, ed. London, 1876.

The patients of C. H. Mastin, and our own were natives of, and had always lived, in Mobile. This climatic influence in the causation of chylous urine and certain other lymph disorders would naturally suggest the probability of the parasitic theory in the production of chylocele, and which is maintained by Dr. Lewis[1] for chyluria and some chylous discharges from the cutaneous surface. But even were we to incline to this theory in all cases of chylous effusions and discharges, we would be compelled to discard it in these present instances, for it is rather difficult to appreciate how filariæ circulating in the lymph or vascular currents would localize or concentrate their energies on any one special branch or part of a vessel to the exclusion of all other portions; and in none of these cases was there noted any other lymphatic derangement or complication, except in our own patient, and in him the accompanying glandular enlargement was evidently of inflammatory origin, and, therefore, of no import in this connection. Besides, the careful examinations to which the fluids were subjected, failed to discover micro-organisms as were found by Dr. Lewis in the researches alluded to above.

Extending this inquiry, however, it seems highly probable to us that, the blennorrhagias (as Dr. Busey[2] has suggested) which are noted as occurring in three of the cases (Vidal's, C. H. Mastin's and our own) played a rather prominent rôle in their production; at any rate, their association with these cases could not have been mere coincidence, and must be regarded as an important and significant feature. In opposition to this opinion, it is quite true that there is no reference to this complication in either the cases of Ruthnum or Ferguson; but when the well-known aversion of persons to

[1] T. R. Lewis—On a Hæmatozoon in Human Blood; its Relations to Chyluria and other Diseases—and the Pathological significance of Nematode Hæmatozoa, Calcutta, 1874. Roberts op. cit.

[2] Holmes' System of Surgery, by Packard, Art. Injuries and Diseases of the Absorbent System, vol. ii, p. 466, Phila., 1881.

acknowledge such attacks is considered, it is easy of comprehension how they may have existed and yet escaped the most careful questioning. Furthermore, the history of Ruthnum's and Ferguson's cases are meagre and brief, and do not include events prior to the testicular affection. Again, in Vidal's patient it should be noticed that gonorrhœa had been contracted several times, although without any noticeable implication of the scrotum or testicle. But then, too, it is not altogether improbable that such did exist, but progressed, possibly, so slowly as to pass unobserved until something directed special attention to the parts, since an obstruction, thinning, and dilatation of a lymph duct could have gone on without anything to indicate such a condition, until, perhaps, some trivial and unheeded strain or exertion produced its rupture, to be succeeded by a rapid filling and distension of the tunica with chyle. Such would account for the comparative suddenness with which the swelling made its appearance in this instance.

In our own patient it is believed a direct connection can be traced between the blennorrhagia and the chylous effusion, and which, we think, is rationally explained in this wise: From the blennorrhagia followed, probably, a specific lymphangitis, which produced thickening and obstruction, or, perhaps, complete obliteration of an afferent lymphatic branch, thus interrupting the lymph current through its channel, and resulting in its dilatation and final rupture. A glance at the history of the case will show that his malady was complicated with double varicocele, which had existed for several years, and to which, evidently, was to be attributed the heaviness and bulk of the testes complained of prior to the existence of the urethral inflammation; and hence, added to the varicocele enlargements was the effusion into the right vaginal tunic, which produced the augumentation in the size of the right testicle shortly after the advent

of the blennorrhagic attack. In a word, the first swelling of the testis was due to varicocele, and the later increase in its dimensions the result of an inflammatory obstruction of a lymphatic around the testicle and cord, ending in rupture of its wall and the escape of chyle into the serous sac of the tunica vaginalis. This supposition is strengthened by the glandular involvement in the right inguinal region following the inflammation of the urethra, and which may be regarded as additional evidence of obstruction in the lymphatics associated with this chain of ganglia.

The *situation* of the lymph varix on the surface of the tunica is of some interest, although, being actually observed and demonstrated in only two instances, the cases are too few for any particular information to be derived therefrom. In both of these, however, it is worthy of remark, the locality was the same, namely, the anterior aspect and at the juncture of the cord with the testicle. This identity in position would suggest the idea that the same duct was affected in both instances, and for which some special anatomical reason existed. But this is simply a matter of conjecture, and, with the intricate network of lymphatics ramifying in the cellular tissue of the cord and around the gland, could have been decided alone by a careful dissection.

Again, the appearance of the varices were exactly similar in both cases with this difference, that, in C. H. Mastin's patient there were the mouths of three or four ducts visible after the varix was abscised, whereas, in our own but a single vessel was observed.

In answering the query as to *which testicle* is most frequently the seat of the malady, we are also opposed by the fewness of the cases. Nevertheless, it is found to be noted as affecting the right gland twice, the left once, and, in one

instance, both testicles were implicated, thus appearing to incline to the right side.

The *ages*, it will be seen, are stated in four out of the five cases, and are, respectively, as follows: 25 years, 42 years, 22 years, and 22 years; but here again the excessive meagreness of the material is such as to deprive this point of much value. We will not be going too far, however, to say that, these figures seem to suggest its more common occurrence in the early and middle periods of manhood, and which, if the supposition as to cause be correct, can be fully explained by the fact of this stage of life being surrounded by greater exposure to the exciting causes.

Notwithstanding the dissimilarity in the reports as to the macroscopical appearances of the evacuated *fluid* in these several cases, the microscope, also taking into consideration the probable misinterpretations given to the ultimate elements of the fluid by some of the observers, in connection with very possible changes which may have taken place in its constituents after effusion, and the admixture of degenerated epithelial and other elements from the serous sac enclosing it, has clearly demonstrated its *nature*, and proven it to be identical in character in each instance.

In Vidal's patient the liquid was likened to milk, hence his terming it galactocele, but the microscopical examination by M. Grassi leaves no doubt as to the true properties of the fluid. The effusion from Ruthnum's case does not appear to have been critically tested by the microscope, although the physical qualities show it to have been chyle—the "greenish yellow tinge" to its otherwise milky color being ascribable, evidently, to the tincture of iodine injected into the cavity of the tunica twenty days previously. Ferguson's case was too apparent to be mistaken, since both to the unaided vision, and microscopically its appearances seem to be exactly similar to chyle, for the large pro-

portion of fat which it contained is characteristic of lymphangiectases and lymphorrhagic discharges, as suggested by Busey.[1]

And the careful examination of the fluids from the patients of C. H. Mastin and our own by the skilled hand of Dr. Tyson resulted in his emphatic decision that they were composed of lymph or chyle.

In referring to the *diagnosis* of this interesting affection, Dr. Busey, in his valuable contribution on diseases of the lymph channels, already frequently alluded to, remarks: "The diagnosis must be determined by the unmistakable evidences of the presence of fluid and the opacity of the tumor." From this, however, we are compelled to dissent, since neither of these, nor both combined, can be considered as pathognomonic of the disorder. There is fluid accumulation, of course, in the vaginal tunic in both hydrocele and hematocele; and the latter affection is always accompanied by decided opacity, which, with a history of injury, is distinctive of such an sanguineous effusion. Hence, simply the presence of fluid and non-transparency[2] is not indicative of chylocele; indeed, the size, shape, feel, and general appearance of this tumor is exactly what is found to distinguish any opaque liquid accumulation in this sac, and so nothing short of aspiration and direct examination of the fluid can absolutely settle the diagnosis. Nevertheless, a tumor of moderate size, non-translucent, with fluctuation on palpation, associated with enlarged inguinal glands, or any lymphatic disorder, the patient, at the same time, presenting the history of one or more blennorrhagias,

[1] Narrowing, Occlusion, etc., Lymph Channels, p. 87.

[2] *Note.*—In some cases of long-standing hydrocele, where the sac is much thickened, opacity by transmitted light is often most marked; and hence, under these circumstances, this, otherwise easily diagnosed, affection is liable to be confounded with *chylocele*, hematocele, and certain other testicular diseases. Again, the same may be said of hydroceles in which the fluid is only slightly tinged by an admixture of a few drops of blood.

and, especially, of residence in a tropical climate, should form a combination of symptoms quite sufficient to awaken suspicion as to the nature of the malady.

As to the method of *treatment* to be adopted, we speak, unhesitatingly, in favor of free incision into the sac, and ligation of the ruptured and leaking duct. This we prefer for the following reasons: First, the certainty of the procedure, since by it every portion of the cavity is fully exposed to view, and the oozing point can be easily and properly secured by ligature; second, the uncertainty of injection, for, in the only case (Ruthnum's) in which it was employed, two injections of tincture of iodine (the now favorite injecting fluid in hydrocele) were required before a cure was effected; third, the possible danger which might attend injection. The very fact of a lymphangitis having existed to a sufficient degree to produce occlusion of a vessel, renders it not altogether improbable that a susceptibility to lymphatic inflammation exists in the subject of the disease, or at least that such an inflammation will more readily occur in the individual affected, and hence the throwing into the tunic of any irritating fluid whatever might set up renewed inflammatory action, resulting in still further lymphatic complication; and fourth, the facility and, apparently, entire harmlessness of the method. In both of the cases in which incision was practised there was no trouble at all—the wounds united by primary union without antiseptic precautions, the patients were up and again at their accustomed avocations within the space of a week, and the cures were complete and permanent, as was evidenced upon re-examination of the cases many months after operation.

In conclusion, we venture the assertion that, chylocele is much less infrequent than either the literature or number of the recorded examples of the disorder would suggest, and which a closer and more careful examination of many so-called cases of hydrocele would fully demonstrate.

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